MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

EXAMINATION FOR

CERTIFICATE IN COMPUTER MAINTENANCE & INFORMATION COMMUNICATION TECHNOLOGY-CMNT2K 11M

FUNDAMENTALS OF PHYSICS (APS 1103)

Answer question One and any other Two questions.

QUESTION 1

a) Explain the OHMS law using graphical illustrations.

(4marks)

b) Three resistors of 20KΩ, 10KΩ and 80KΩ are connected in parallel. They are the connected in series to 50KΩ and 70KΩ resistors. The network is then supplied with 24V d.c. Calculate:

i. total resistance in the circuit
ii. voltage drop in the parallel circuit
iii. total current in the circuit
iv. current through 2KΩ, 10KΩ and 80KΩ resistors
v. total power in the circuit

(9marks)

c) Determine the colour codes for the following resistors:

i. 1.9MΩ±20%
ii. 330KΩ±10%
iii. 470Ω±5%
iv. 4.7MΩ±2%

(8marks)

e) With the aid of a circuit diagram explain the operation of a full wave bridge rectifier.

(9marks)

QUESTION 2

a) Calculate the maximum and the minimum values of the following resistors given the colour codes. (All answers in KΩ)

i. violet, green, yellow
ii. Blue, black, purple, silver
iii. green, red, yellow, gold

(10marks)

b) Differentiate between step-up and step-down transformers. (4 marks)

c) Briefly explain the following:

i. Intrinsic semiconductor
ii. Extrinsic semiconductor

iii. Doping (6 marks)

QUESTION 3

a) Define the following terms:
i. Capacitance
ii. Time constant
iii. Transmission ratio
iv. Self inductance
v. Mutual inductance (10 marks)

c) With the aid of circuit diagrams explain the following with regard to diodes:
i. Forward biasing
ii. Reverse biasing
(6 marks)

c) Differentiate between rectification and voltage regulation.

(4 marks)

QUESTION 4

a) Three capacitors of 300μF, 200μF and 400μF are connected in series and then connected to 3600μF capacitor in parallel. The network is then supplied with 12V D.C.
i. Draw the circuit diagram
ii. Calculate the capacitance in the circuit
iii. Charge across the 3600μF capacitor
iv. Energy in the circuit

(10 marks)

b) Describe two applications of P-N junction diodes. (4 marks)

c) Explain the kirchoffs law on:
i. Current
ii. Voltage (6 marks)

QUESTION 5

a) Using circuit diagram show the following transistors configurations:
i. Common base
ii. Common collector
iii. Common emitter (9 marks)

b) Explain the following:
i. Resistance
ii. Reactance
iii. Impedance (6 marks)

c) With the aid of diagrams differentiate between N-P-N and P-N-P transistors.

(5 marks)